
Dopaminergic differentiation of human pluripotent cells.

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Public Summary:

We compared two different protocols for making neurons that produce dopamine from pluripotent stem cells. Both protocols generate functional and mature neurons, but are intrinsically different and therefore better suited for different applications. The ability to effectively differentiate these cells into dopamine neurons is critical for understanding the basic biology of human development, and also for generating medically relevant cells for modeling disease in a dish and cell replacement therapy.

Scientific Abstract:

Here we describe protocols for the dopaminergic differentiation of pluripotent stem cells. We have optimized and compared two distinct protocols, both of which are chemically defined and applicable to both embryonic and induced pluripotent stem cells. First, we present a five-step method based on rosette formation (Basic Protocol 1); then we describe a monolayer paradigm based on inhibition of alternate developmental pathways (Basic Protocol 2). Directed differentiation of pluripotent cells into specific cell types is a crucial step towards understanding human development and realizing the biomedical relevance of these cells, whether for replacement therapy or disease modeling. Curr. Protoc. Stem Cell Biol. 22:1H.6.1-1H.6.11. (c) 2012 by John Wiley & Sons, Inc.

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